A PROGRAM FOR IMPROVING MANAGEMENT AND RESEARCH OF FISHERIES IN THE SOUTHEAST REGION

SOUTHEAST/YAKUTAT SHELLFISH FISHERIES

Project Bluebook – 2005

Alaska Department of Fish and Game
Division of Commercial Fisheries
Southeast Region

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SHELLFISH FISHERIES INTRODUCTION

Overview of Southeast Region Shellfish Fisheries

Shellfish fisheries in the Southeast Region target a diversity of species across all management areas from Ketchikan to Yakutat. The major shellfish fisheries occur in Area A, from Dixon Entrance to Cape Fairweather, and these include pot fisheries for spot and coonstripe shrimp, Tanner crab, red king crab, golden king crab, and Dungeness crab, as well as a long-standing beam trawl fishery for pink shrimp. Yakutat area fisheries, from Cape Fairweather to Cape Suckling, include pot fisheries for Tanner crab, Dungeness crab, and shrimp, as well as a trawl fishery for shrimp and a dredge fishery for scallops. Regionally, all of these fisheries are important economically, grossing over $14 million annually in landed value in recent years. From a statewide perspective, the shrimp fisheries are the last significant fisheries of their kind, and the Dungeness crab fishery is the largest in the state.

The major issues facing the region's shellfish fisheries are fleet intensification, local depletion, and the resulting need for better stock assessment information and for more localized and active management. Traditionally, the shellfish fisheries were managed with regional guideline harvest levels based on historical catch records. Those methods are largely inadequate now that our fleets have become larger and more efficient. As a consequence, the shellfish stocks have been fished hard, in some cases for decades. As fishing pressure has grown, the region's shellfish stocks have seen depletion of local populations. This occurred in the past decade in the Yakutat area for both Dungeness and Tanner crabs, and those fisheries are closed to allow rebuilding to occur. Similar large scale closures of shellfish fisheries in Southeast Alaska are not anticipated; however, local harvest and effort trends indicate our shellfish stocks require increasingly fine-scaled assessment and management to avoid depletions of local populations that can accumulate to force regional stock closures.

Stock Assessment for Southeast Regional Shellfish Fisheries

The information available to manage regional shellfish fisheries lags far behind the information that is needed. Shellfish abundance is difficult to estimate. They do not swim home to natal streams where they can be counted, as salmon do, and they have a diversity of complex life histories that makes stock assessment challenging. However, shellfish are not impossible to count, and in fact, our department has pioneered the use of various stock assessment tools to estimate crab populations, as for example, has been done with several important stocks in the Bering Sea. The value in doing so is to be able to set harvest levels based on abundance, which is the hallmark of successful fisheries management, including our state's salmon management program. To this end, we have adopted the catch-survey analysis used for several Bering Sea crab stocks to estimate the abundance of red king crab in Southeast Alaska, the only regional shellfish program for which we have absolute stock abundance information. This information has been used successfully for nearly a decade to set conservative harvest levels based on abundance.

The shellfish program in the Southeast Region has made substantial progress towards developing improved stock assessment for species other than red king crab; however, much of what has been done to date in improving stock assessment has been on a trial or pilot study basis. There are significant shortfalls in funding to fully establish the programs that are needed to meet the department's commitment to sustainable fisheries. The stock assessment projects described here are designed as a concerted move towards abundance-based management similar to the regional program for red king crab.

Management of Southeast Regional Shellfish Fisheries

Management of the shellfish fisheries in the Southeast Region is in transition. Historically, harvest guidelines were set for each region (Southeast and Yakutat) as a whole without regard to fishing patterns and local stock concentrations. For this reason, management has been the responsibility of the regional shellfish management biologist and there has been a reluctance to move towards more localized management without sufficient staffing and operational funds. Intensification of regional shellfish fisheries has led to an evolution away from single guideline harvest levels for the region as a whole.

Increasing effort in the Southeast Alaska pot shrimp fishery in the mid-1990s led the department to establish district level guideline harvest levels and to transfer management authority to individual area offices, principally Ketchikan, Petersburg, Sitka, Juneau and Haines. Staff in those offices can more fully focus on tracking local catches to stay within the guidelines, and they are also more attuned to local area concerns, such as localized depletion and missing year classes. Transferring management authority to area offices is not the solution for all shellfish fisheries; indeed, the area office staffs would have to be enlarged significantly for that to be possible. Instead, gradual changes are being put into place to accomplish localized management where feasible.

The red king crab fishery has a mixture of local and regional management. The guideline harvest level is set for the region, but the survey-based stock assessment program allows the department to identify local areas, usually bays, having low abundance or weak stock segments. As needed, these areas may be closed for one or more seasons, or they may be opened for a shorter period than the region as a whole to allow local populations to rebuild. Also, to meet commercial fishery allocation guidelines set by the Board of Fisheries, the department sets maximum harvest levels in Section 11-A near Juneau. The 2001 fishery was closed early in Section 11-A to stay within the allocation guidelines. Similar harvest controls are possible on a district level basis using stock abundance estimates from the assessment surveys, and these may be used in the future depending on the availability of staff resources to achieve more finely scaled management.

The golden king crab fishery currently has seven management areas in regulation. This is two more than in prior years as a result of Board of Fisheries action, which divided two of the five traditional areas. This was done to allow harvests to more accurately reflect varying stock status among areas. The drawback of more finely dividing the management activity has been an increasing burden to track local catches by department staff. Despite this burden, the department recognizes the importance of more localized management in ensuring long-term sustained yield.

This is an important economic as well as biological goal, given that the golden king crab fishery has exceeded the harvests of the red king crab fishery by a factor of two in recent years.

The Southeast Tanner crab and Dungeness crab fisheries are two of the most valuable regional shellfish fisheries. They are both managed on a regional basis, and both have stock assessment surveys in developmental stages. As the stock assessment programs mature, there will be increasing opportunities to manage these on a more precise basis to minimize the risk of local depletions and to ensure long-term sustained yield. It will be important for these fisheries to have adequate staffing in the regional and area offices to meet the increasing needs and opportunities for localized management.

Table 1. Summary of proposed shellfish fishery projects and estimated costs (thousands of dollars).

Project	Estimated First-Year Cost	Estimated Annual Continuing Cost	Duration
A. Shellfish Project Staff			
A.1. Southeast Alaska Shellfish Biometrics	$85.0	$85.0	Long Term
A.2. Southeast Alaska Shellfish Project Fishery Biologist II	$75.0	$58.0	Long Term
B. Shellfish Stock Assessment			
B.1. Southeast Alaska Golden King Crab Stock Assessment	$60.0	$60.0	Long Term
B.2. Southeast Alaska Pot Shrimp Stock Assessment	$65.0	$65.0	Long Term
B.3. Tanner Crab Mark-Recapture Project	$35.0	--	One Year
B.4. Southeast Alaska Tanner Crab Stock Assessment	$66.0	$66.0	Three Years
B.5. Red king crab mark-recapture study	$35.0	$34.0	One Year
B.6. Southeast Area Dungeness Crab Stock Assessment	$143.5	$143.5	Long Term
B.7. Yakutat Area Dungeness Crab Stock Assessment	$30.0	$30.0	One Year
B.8. Yakutat Area Tanner Crab Stock Assessment	$30.0	$30.0	One Year
C. Personal Use Harvest Documentation			
C.1. Southeast Region Shellfish Personal Use Harvest Documentation	$33.0	$33.0	Long Term

PROPOSED PROJECTS

This document contains a list of projects proposed for increased funding. The projects described are either not conducted due to a lack of funding or are currently operated at levels insufficient to meet increasing management needs. Projects are grouped into four categories (A–D) and are listed in Table 1. The categories are not prioritized, but the projects within each category are listed in order of priority.

The first category (A) includes a list of additional staff needed to maintain operating the Shellfish Project at the current level of activity. Additional staffing is the greatest need of the Shellfish Project. Currently, shellfish biometric needs are addressed by one Biometrician II, a position shared with the Miscellaneous Invertebrate Project. An additional biometrician is needed to develop the analytical approaches and tools for determining sustainable harvest levels for the region's major shellfish fisheries. Due to the overwhelming workload on the Shellfish Biometrician, Shellfish Project biometric needs are not being met and a backlog of analyses continues to grow. Additionally, current plans are to implement a major split within the Shellfish Project to create separate Research and Management sections. This will be done in response to a need to better focus attention on crab management issues and stock assessment development and reporting. There exist a minimal number of positions to effectively create this split and additional staff will allow much smoother operation of these two units. Due to reductions in funding in FY04, the Shellfish Project lost two PCNs, a Fishery Biologist II and a Fish and Wildlife Technician III. The biologist position's primarily responsibilities were to 1.) plan, implement and report on the Tanner crab stock assessment survey, 2.) take a lead role management of the Tanner crab/golden king crab fishery, and 3.) assist in development of Tanner crab management plan. Functions of both positions have been distributed among other Shellfish Project staff members, however this has increased already heavy workloads and has lessened the ability to adequately meet the needs of other shellfish projects. The Shellfish Project has taken on some major surveys over the past several years, with only a modest increase in staffing. Newly implemented projects include a Tanner crab stock assessment survey and a pot shrimp stock assessment survey. Pot survey work was also done for Dungeness crab in 2000-2004 but that project has been suspended. Although vital information on stock status is being collected, through stock assessment surveys, their development has reduced the time available for staff to regularly communicate with commercial fleets, creating a growing gap of understanding between fishers and the department. Furthermore, the insufficient staffing levels are preventing full and timely incorporation of this information into management and dissemination to the public.

The second category (B) covers eight stock assessment projects. Projects in this category were ranked according to the most pressing needs to fulfill the mandate for achieving sustainable harvests. The first priority project is stock assessment for the Southeast golden king crab fishery due largely to the paucity of information on the stocks and the growing importance of this fishery. The recent five year average exvessel value of the golden king crab fishery has averaged $2.2 million. This fishery essentially collapsed from 1992-1996 but has rebounded in recent years. Stock assessment for the pot shrimp fishery is ranked second. This is probably the single most fragile shellfish fishery in the region in terms of the potential for serial stock depletion, and

also one of the most challenging to assess. In addition, the commercial pot shrimp fishery is quite valuable with a recent five-year average exvessel value of approximately $2.5 million. A Tanner crab mark-recapture project is ranked third. There are questions surrounding the assumptions inherent in the depletion model that the department currently uses to estimate Tanner crab stock size and that model could be ground truthed using an independent estimator. The fourth project is support for a region wide Tanner crab survey. The department conducts a Tanner crab survey that provides appropriate relative abundance information, but additional research is needed to augment survey data so that those data can be used for abundance-based management. The recent five-year average exvessel value of the Tanner crab fishery has been approximately $1.8 million. The fifth project would be a red king crab mark-recapture study. The result of that project would be an independent estimate of population size that could be used to ground truth estimates derived from the catch-survey model. The recent five-year average exvessel value of the red king crab fishery has been approximately $1.1 million. Stock assessment for Southeast Alaska Dungeness crab stocks is ranked sixth. The Southeast Dungeness crab fishery is very intense in nature and there is a high degree of uncertainty regarding stock status and the viability of the relatively passive management system that has been used historically. Harvests in this fishery have been relatively stable at approximately 4.4 million pounds per year with a record harvest of 7.3 million pounds in 2002. The recent five-year average exvessel value of the Southeast Alaska Dungeness crab fishery has been approximately $6.4 million. The seventh and eighth ranked projects are for reconnaissance surveys of Yakutat area Dungeness and Tanner crab, respectively. Both fisheries are closed and are to remain closed until better stock status information is obtained. These projects would be limited in nature and would be fielded on a biannual basis to determine if stock recovery has taken place. If stock recovery is documented with small-scale surveys more detailed stock assessment monitoring projects would be developed.

The remaining category (C) has only one project. Personal use harvest documentation is important for estimating total fishing mortality as personal use harvests increase in significance relative to commercial harvests. Obtaining estimates of personal use red king crab harvest was a high priority recommendation from an independent review panel convened in 2005.

A. Southeast Alaska Shellfish Project Staff

Project A.1. Southeast Shellfish Biometrics

Location: Region wide.

Primary Objective: To fully develop the stock assessment methods and to provide ongoing biometric support for the region's shellfish research projects.

Description: Currently, just one position is funded to provide biometric support for all shellfish and dive fisheries in the Southeast and Yakutat areas. A backlog of stock assessment modeling, analyses, and reporting is accumulating. The recent addition of two major stock assessment projects (Dungeness crabs and pot shrimp) are now in the phase of project development and

require a significant amount of population modeling and harvest strategy determination. Other existing, new projects requiring biometric support are the onboard fishery sampling programs for golden king crab and beam trawl shrimp. Additional biometric support for future, high priority studies include stock assessment programs for Southeast Alaska golden king crab fisheries and Yakutat area Dungeness and Tanner crabs. Funding for this position was included in the division's new fish and game license fees budget effective FY02, however, this position was cut following lower than expected revenues from license sales.

Duration: This project requires stable long-term funding because it is the salary support for a professional biometrician.

Estimated Annual Costs: $85.0. The division has included this project in the FY07 request for the General Fund component.

Project A.2. Southeast Alaska Shellfish Project Fishery Biologist II

Location: Region wide.

Primary Objective: To conduct fishery management and stock assessment for the region's Tanner crab fishery and assist with other shellfish management and research needs.

Description: Currently, the Tanner crab fishery management and research responsibilities are met by other shellfish staff. Although all other major shellfish fisheries have a project biologist assigned to them (red and golden king crab, shrimp and Dungeness crab), the Tanner crab fishery stands alone without dedicated personnel. The Tanner crab fishery is an important shellfish fishery in Southeast Alaska and management of this fishery is complicated by a simultaneous golden king crab fishery, recent low stock levels, intense commercial fishing directed at traditional 'core' harvest areas, and low acceptance by the fleet. Management of this fishery would highly benefit from a dedicated biologist to both reduce the excess workload of other staff members, and to direct more attention to this complicated fishery.

Duration: This project requires stable long-term funding because it is the salary support for a professional biologist.

Estimated Annual Costs: $75.0

B. Stock Assessment Projects

Stock abundance information that is collected independently of commercial harvest data is critically important for assessing the status of shellfish populations. The reason for this is that commercial shellfish fisheries target the largest individuals in the stock; however, the abundance of smaller individuals, as well as the abundance and reproductive condition of females, is also important information needed for decisions on allowable harvests. Hence, surveys are designed to assess these non-target as well as the marketable individuals of a fished species. This approach has proven successful in the region's red king crab assessment program, and the intent of the projects in this section is to bring the other major shellfish fisheries in the region to the same level of survey information.

Project B.1. Southeast Alaska Golden King Crab Onboard Observer

Location: Central and Northern Southeast Alaska Area.

Primary Objective: To implement an onboard observer program for the golden king crab fishery in Southeast Alaska.

Description: The hiring of a FWT III will directly allow increasing the golden king crab on-board sampling program. The division currently has no specific funding support for this species. This position will be directly involved in Golden King Crab onboard sampling, as well as helping with other crab and shrimp surveys and sampling efforts. This onboard observer program has strong support from the King and Tanner Task Force. The department has no fishery independent survey program for Golden King Crab, the only information collected is from dockside port sampling. If this observer could be deployed, escape rings on commercial pots could be sewn closed which would allow the pots to retain a more representative cross segment of the population. These pots could be fully sampled by the observer and the department would have more information on the size, age, and sex composition (and other biological characteristics such as female clutch size) of this resource. It is possible that with this information the department would be more comfortable being somewhat more aggressive in the management of this fishery.

Duration: A long-term stable funding source is desired.

Estimated Annual Costs Beginning FY07: $60.0. The division has included this project in the FY07 request for the General Fund component.

Project B.2. Southeast Alaska Pot Shrimp Stock Assessment

Location: Southern and Central Southeast Alaska.

Primary Objective: Expand the pilot stock assessment surveys to more fully cover the major pot shrimp fishing grounds.

Description: Commercial Fisheries Division has conducted surveys in four areas of Southeast Alaska. Those areas include Section 3-A, District 7, Section 13-C, and Tenakee Inlet. The survey work done in Districts 3 and 7 were originally funded through a Federal Nearshore Fisheries Grant but that grant expired and there is currently no federal funding for shrimp surveys in SEAK. The surveys in Hoonah Sound and Tenakee have been conducted using an industry contractor in all years except one (when there was no interest from the public in bidding the contract). In that year the department conducted the survey in Hoonah Sound using the State vessel Kittiwake. There has never been any specific funding support for the Hoonah Sound and Tenakee surveys, the sea duty, transportation and miscellaneous costs have simply been absorbed within exiting General Funds (mostly from salary vacancies). This increment would provide specific State funding support for the Southeast Alaska commercial shrimp pot survey program. Funds would pay for sea duty costs for existing division staff, vessel charter costs if necessary, State vessel costs in areas where State vessels are used for the surveys (District 7 survey has always been done with a State vessel). Other costs that would be covered by this increment include travel costs for staff and miscellaneous costs associated with the surveys (bait, miscellaneous supplies, etc).

The department also conducts inseason on the grounds surveys in several areas of the region. These areas include Districts 3, 6, 7, 8, 10, 12, and 13 (Hoonah Sound). The purpose of these surveys is to collect unsorted biological sample data directly from commercial pots, determine catch rates to determine season length, and to provide direct interaction between industry and the fleet on the grounds. The costs of these inseason commercial surveys have never had specific directed funding from any source. This increment would be used to cover some of these costs (State vessels costs, sea duty costs, fuel, etc) if the funds are not spent to cover pre- and/or post-season surveys.

Duration: A long-term stable funding source is desired.

Estimated Annual Costs: $65.0. The division has included this project in the FY07 request for the General Fund component.

Project B.3 Tanner Crab Mark-Recapture Project

Location: Northern Southeast Alaska

Primary Objective: To estimate exploitation rate and verify accuracy of depletion estimator

Description: Although the department conducts an annual stock assessment survey to help evaluate overall level and condition of the Tanner stock in Southeast Alaska, another important source of information are logbooks reporting detailed catch and effort information from the commercial fishery. From the logbook data, estimates of abundance have been calculated through the use of a depletion model. This method is less sophisticated than other models used to estimate abundance, such as a catch-survey model, which is used for estimating red king crab abundance in Southeast Alaska. Until more advanced modeling of Tanner crab data is developed, the department will continue to rely on depletion estimates to help evaluate stock levels. Since the depletion estimate relies solely on fishery-dependant data, there is some skepticism about the accuracy of the estimates. One way to verify the accuracy of depletion model estimates is to conduct a mark-recapture experiment. This would allow an independent estimate of exploitation rate, by examining the proportion of marked crab that are caught in the commercial fishery relative to the number that are released during a marking event just prior to the fishery. Costs include one week of vessel time, tags, travel, and rewards for tag returns.

Duration: One year

Estimated Costs Beginning FY07: $35.0

Project B.4. Southeast Alaska Tanner Crab Stock Assessment

Location: Northern Southeast Alaska.

Primary Objective: To estimate Tanner crab index of abundance

Description: The department currently funds a Tanner crab stock assessment (survey) program in northern Southeast Alaska. Additional funds come from a Federal Nearshore V grant beginning in FY04 to conduct pot soak time experiments. As fish and game license fees that fluctuate annually fund much of this survey, stable long-term funding is needed.

Cost per year for conducting soak-time experiments and a tagging project for Southeast Tanner crabs includes 6 mm for a project assistant, sea duty pay, vessel charter, and operational funds.

Duration: Three years.

Estimated Annual Costs Beginning FY07: $66.0.

Project B.5. Red King Crab Mark-Recapture Study

Location: Southeast Alaska

Primary Objective: To produce estimates of biomass for several stocks in Southeast Alaska.

Project Description: Status of red king crab populations in Southeast Alaska are monitored in part by conducting a stock assessment survey that uses commercial-style pots to sample crab. A primary objective of the survey is to produce estimates of biomass for legal and mature male components of the population. This is accomplished by using a catch-survey model that estimates relative abundance by measuring changes in catch rates of various size classes of crab between years. The proposed project would estimate population size and biomass by using mark-recapture methods. The study would rely on the same techniques for sampling crab, however the study design and statistical analysis would be much different. The result would be an independent estimate of population size that could be used to ground truth estimates derived from the catch-survey model. This information could help verify estimates obtained by using existing methods or provide insights to help improve the current stock assessment approach.

Duration: 1 Year

Estimated Cost: $35.0k

Project B.6. Southeast Area Dungeness Crab Stock Assessment

Location: Southeast Alaska.

Primary Objective: Reinitiate the survey program that was cancelled in 2005 to enhance the department's survey data time series and life history research in support of management.

Description: The Dungeness crab fishery in Southeast Alaska is intensifying, and we are working with an industry task force and the Alaska Board of Fisheries to develop fishing strategies to minimize risks of overexploitation and stock depletions. We initiated a pilot program in FY01 to estimate abundance and exploitation rates of Dungeness crab in two major fishing areas of Southeast, near Petersburg and Wrangell. In FY02, we expanded the preseason stock assessment survey to additional fishing grounds in northern Southeast, and added post-season surveys in both southern and northern Southeast. Post-season surveys were eliminated due to budget shortfalls in FY04 and the entire program was cancelled in FY05 (2005 field season).

In conjunction with the survey efforts, the department had initiated basic life history research to estimate growth rates, molting increments, and molt timing and natural mortality rates. A tagging study was implemented to determine molt increment and molting probability in Dungeness crab. In addition, pot soak time and mesh selectivity studies are needed. These data are critical for interpreting survey results.

Additional biologist support, sea duty pay, vessel charter, and operational funds are needed to more fully implement the stock assessment and analysis program. There are no Federal funds for this project.

Duration: A long-term stable funding source is desired.

Estimated Annual Cost Beginning FY07: $143.5.

Project B.7. Yakutat Area Dungeness Crab Stock Assessment

Location: Yakutat.

Primary Objective: Implement a small-scale reconnaissance stock assessment survey for Dungeness crab in the Yakutat area.

Description: The Yakutat area Dungeness crab stocks are presently in a collapsed state. The commercial fishery was closed effective for the summer and fall portions of the 2000/2001 fishing season. No stock improvement is evident with existing information. The fishery will remain closed until stock recovery can be demonstrated and an adequate research and management program has been developed for this fishery. The costs for initiating a small scale reconnaissance stock assessment survey for Yakutat Dungeness crabs include funds for commercial vessel charter costs, sea duty pay, and operational funds. The department conducted a limited Dungeness crab test fishery in the Yakutat area in 2004. Results from that project indicate that Dungeness crab stocks in the Yakutat area continued to be very depressed.

Duration: Biannually until some level of stock recovery is identified.

Estimated Annual Costs Beginning FY07: $30.0.

Project B.8. Yakutat Area Tanner Crab Stock Assessment

Location: Yakutat.

Primary Objective: Implement a small-scale reconnaissance stock assessment survey for Tanner crab in the Yakutat area.

Project Description: The Yakutat area Tanner crab stocks are presently in a collapsed state. The commercial fishery was closed effective with the 2000/2001 fishing season. No stock improvement is evident with existing information. The fishery will remain closed until stock recovery can be demonstrated and an adequate research and management program has been developed for this fishery. This project would work with industry to identify sampling locations and to conduct biannual sampling to assess the status of the stock. The costs for initiating a

small-scale reconnaissance stock assessment survey for Yakutat Tanner crab include funds for commercial vessel charter costs, sea duty pay, and operational funds.

Duration: Biannually until some level of stock recovery is identified.

Estimated Annual Costs Beginning FY07: $30.0.

C. Personal Use Harvest Documentation

Accurate harvest records are vitally important in fisheries management and the Commercial Fisheries Division goes to great lengths to obtain all catch information for commercial shellfish fisheries. Presently, there is a very limited program for documenting personal use catches. Several personal use fisheries have grown in recent years, and total mortality from those fisheries has become significant relative to total commercial harvests.

Project C.1. Southeast Region Shellfish Personal Use Harvest Documentation

Location: Southeast Alaska and Yakutat.

Primary Objective: To collect personal use shellfish harvest information from all major harvest areas/communities in the region.

Description: Presently, our knowledge of harvest by personal use and subsistence fishers of commercially important species of shellfish in the Southeast Alaska and Yakutat Areas are extremely limited. Our data is limited to a red king crab permit requirement in the Juneau area, and creel census data and mail-out survey data obtained by the Sport Fish Division from major communities in Southeast. The creel census primarily occurs during the salmon season, so harvesters are typically not interviewed during the late fall–spring season. A key component of population modeling requires knowledge of harvest by all user groups (known mortality). This project would fund conduct of a comprehensive, region-wide shellfish harvest survey.

Duration: A long-term stable funding source is desired.

Estimated Annual Costs: $33.0.